

must have been added as an afterthought, as these pumps do not appear in the table of contents or in the list of plates. This volume should prove valuable in guiding persons requiring pumping machinery, both in the choice of the pump best suited to their requirements, and as to the firms from whom they can be purchased.

The third volume deals with the machinery employed in the various processes involved in the manufacture of coal-gas, such as the handling of coal, retorts, stoking, the removal of coke, condensers, exhausters, washer-scrubbers, purifiers, gasholders, and various gas appliances, with the names of the principal makers; but some of the subjects are referred to in a very cursory manner, two pages only being given, for instance, to water-gas plant, and also to the very important economic question of bye-products. The descriptions are illustrated by one hundred and thirteen views of plant and machinery; and following the principle adopted in the earlier volumes, a classified list of British gas-engineering literature is added at the end of the book, and also of British manufacturers of gasworks' plant and machinery, occupying respectively eleven and twenty-eight pages, amounting to two-fifths of the text of the book. The author holds very optimistic views as to the future of the gas industry, which he considers are borne out by the remarkable success of the recent Gas Exhibition at Earl's Court, and which, in spite of frequent gloomy prophecies of the injurious influence on it of the development of electric lighting, has more than doubled itself in the last twenty years.

Everything has been done on the publishers' part to render these volumes attractive, by very well reproduced illustrations, unusually large and wide-spaced print, good paper, neat binding, and a moderate price; and they may reasonably be expected to be very useful, from a commercial point of view, in making the scope and efficiency of British manufactures and machinery more fully known in the colonies and foreign countries, and thereby extending the range of British trade and engineering.

A STANDARD ATLAS OF ENGLAND AND WALES.

The Survey Atlas of England and Wales. A Series of 84 Plates of Maps and Plans, with Descriptive Text, illustrating the Topography, Physiography, Geology, Climate, and the Political and Commercial Features of the Country. Designed by and prepared under the direction of J. G. Bartholomew. (The Edinburgh Geographical Institute, 1903.) Price 2½ guineas.

THIS sumptuous volume, which began to be issued in parts in 1903, is a credit to all concerned with its publication. Mr. Bartholomew and the Royal Geographical Society are to be congratulated on adding a work of great beauty as well as of scientific merit to the resources of all who have to study England and Wales. These are a majority of the thoughtful members of the community, for "know thy country" is a maxim next in importance in the

modern world to "know thyself." A work which concentrates in one volume the materials for a close study of its surface anatomy and human settlements and routes, as well as a general survey of its resources and activities, is a precious possession, which will increase in value as years pass, for it is the most condensed, yet clear and precise, summary of certain aspects of the material condition of England and Wales at the beginning of the twentieth century which the future historian will find within reasonable compass. What would present historians not give for similar records of the England of past centuries?

The present work may be divided into four parts:—(1) general geographical maps; (2) detailed topographical maps; (3) town plans; and (4) text and tables.

(1) The general maps are more complete than in any other atlas, although most of them have been published previously in another form. The first plate, the oro-bathymetrical map, is a new one, and contains names for the outstanding features of the land which may be regarded as at least semi-official. They were selected by Dr. Mill and Messrs. Chisholm and Mackinder at the request of the Royal Geographical Society. It is convenient to have such a set of names, and undoubtedly the greater number, even of those which are new or have had an extended significance given to them, will be generally accepted. There are, however, one or two exceptions. The term gap, which has been familiarised to us in recent years, more particularly in American writings, can hardly be applied to the broad lowland between Wales and the Pennines, though it may be used for the valleys of the Tyne and Aire, which afford narrow but easy routes across the Pennines. Norfolk Edge and East Anglian Ridge are other terms which seem to imply more pronounced topographical features than they represent. The Vale of Pickering seems unduly extended into that of York. We fail to discover any very clear rule as to what features should and should not be named. We find the Vale of York, but not the Vale of Trent or Severn; the Vale of Taunton, but not of Pewsey. While it is a pity that something more systematic and complete has not been attempted, some of the names are distinctly happy and will remain.

The geological map is unfortunately on a smaller scale than that in the companion "Atlas of Scotland," and hardly shows sufficient detail unless for the country south of London, which is shown on an inset. A smaller scale map illustrates the distribution of old, young, and coal-bearing rocks and iron centres. It is clear, but coal and iron are shown in greater detail on a map of mineral products which comes later. Maps of vegetation, lands in pasture or in crops, afford material for a long chapter in geography and economics. The next two sheets show maps of monthly and annual rainfall and temperature, driest and wettest months, the annual range of temperature, and the annual temperature not reduced for altitude. The subsequent two sheets depict the railways in black, the spheres of influence of the various companies being shown by different tints. We welcome

an attempt to illustrate the areas tributary to each railway company, which, if properly done, would be a most valuable guide to business men. The present map is hardly successful in showing more than the obvious, and in the crowded area of south Lancashire and the West Riding of Yorkshire, even when shown on a larger scale in an inset, the method adopted does not do justice to some of the lines. No attempt has been made to distinguish areas which are served by more than one railway; nor does the compiler seem to have taken configuration into account in preparing the map. No doubt the details can be worked out on the half-inch maps which come later, but what might have been a very effective and useful map is somewhat spoilt. It resembles a rough railway company diagram rather than the other maps of the atlas.

The density of population maps by Mr. Bosse, in which the uninhabited area is first marked off, are clear, and reveal a multitude of points not indicated on maps which show the density of population by counties. They form a very effective contrast to two maps showing densities of agricultural, of industrial and commercial population by counties, which, however, summarise the more obvious contrasts of density and of distribution. Administrative divisions, political and ecclesiastical, a commercial and a mineral map end the first section of the atlas.

(2) It is scarcely necessary to direct attention to the merits of Bartholomew's half-inch contoured map, which everyone uses who cycles or motors. It is beautifully printed on sixty-seven sections. The contour lines, as on the Ordnance maps, are shown for every 100 feet up to 1000 feet, and for every 250 feet above that. The areas between each consecutive 100 feet up to 400 feet are tinted in shades of lighter and lighter green, between each 200 feet to 1000 feet, and then between each 250 feet, in deepening shades of brown, a purplish tint being used for the bands between 2750 feet and 3000 feet. This is a reasonable compromise, but for students of orographical features a single colour in different shades would give a clearer picture. The great defect of our Ordnance maps is the absence of a closer contour interval, and for the inadequacy of the existing data in exhibiting the characteristics of the relief Mr. Bartholomew cannot be held responsible.

These maps are wonderfully accurate; in some places they are more up to date than the survey sheets. Only here and there have we detected minor errors. The arrangement of the sections in the atlas is confusing. The numbers zigzag in such a way that it is not possible, without turning to the sheet inside or to the key map, to discover whether they run eastwards or westwards. This difficulty might have been avoided by printing a key map beneath the number outside each sheet and shading the area of the section drawn inside.

(3) The town plans call for little comment, except that they should have been on a uniform scale.

(4) The text consists of clear descriptions of the physical features in relation to political and commercial development by Dr. Mill, with one or two slips, and of the geological features by Sir Archibald

Geikie; temperature and rainfall tables for more than a hundred stations (the latter, unfortunately, only for a ten years' mean); agricultural, population, ecclesiastical, demographic, political, commercial, industrial, and railway statistics; a list of railways; the etymology of English and Welsh place-names; and an invaluable bibliography of the maps of the country from the earliest times, specially compiled by Mr. Bartholomew.

It will be seen that the atlas deserves its comprehensive title. The time and art required to produce it have been great, and Mr. Bartholomew very properly makes due acknowledgments to his skilled assistants. The execution is admirable, and the work is not merely one of great scientific importance, but also a specimen of cartography worthy of the reputation of the house of Bartholomew.

LEATHER FOR BOOKBINDING.

Report of the Committee on Leather for Bookbinding.

Edited for the Society of Arts and the Worshipful Company of Leathersellers by the Right Hon. Viscount Cobham and Sir Henry Trueman Wood. Pp. 120. (London: George Bell and Sons, 1905.) Price 10s. 6d.

IN recent years there has been considerable dissatisfaction with the quality of leather used for bookbinding; although many old books have their bindings still in good condition, others more recently bound have become dilapidated. In 1899 the School of Arts and Crafts formed a committee for the investigation of the subject, which appealed later to the council of the Society of Arts requesting it to undertake a thorough examination of the whole question, and in February, 1900, the society agreed to appoint a committee for the purpose. The first meeting was held in May, 1900, and two subcommittees were elected from the members; the first, consisting of Mr. Cyril Davenport, of the British Museum Library; Dr. J. Gordon Parker, director of the London Leather Industries' Research Laboratories; Mr. A. Seymour-Jones, leather manufacturer; Mr. W. J. Leighton, bookbinder; and Mr. Douglas Cockerell, bookbinder, was to visit various libraries to ascertain the comparative duration of various leathers used at different periods and preserved under different conditions. The second subcommittee consisted of Dr. J. Gordon Parker, Prof. Henry R. Procter, professor of leather industries at Leeds University, and Mr. A. Seymour-Jones; its duty was to ascertain the cause of any deterioration noticed and to suggest methods for its prevention. Mr. M. C. Lamb, director of the leather dyeing and finishing department of Herold's Institute, was afterwards added to this committee.

The committee reported in June, 1901, and the report was printed in the *Journal* of the Society of July 5. It was considered desirable to reprint the report in a more permanent form, and with the financial assistance of the Leathersellers' Company the present volume has been produced, which contains more detailed accounts of the work of the subcommittees